Oregon

Dr. John A. Kitzhaber, M.D., Governor

Department of Environmental Quality
Northwest Region
2020 SW 4th Avenue, # 400
Portland, OR 97201-4987
(503) 229-5263
FAX (503) 229-5471
TTY 711

March 12, 2013

Kelli Gustaf, Environmental Coordinator
BP Pipelines & Logistics
Olympic District
2201 Lind Avenue SW, Suite 270
Renton, WA 98057

RE: No Further Action Determination for 1995 and 2000 Fuel Releases
BP Olympic Pipe Line Company, Portland Delivery Facility
ECSI #3342

Dear Ms. Gustaf:

The Oregon Department of Environmental Quality (DEQ) has completed its review of site investigation reports dated 1995 to 2004 for the Olympic Pipeline Portland Delivery Facility, to support this No Further Action (NFA) Determination. The investigation and remediation work described in the reports was performed without DEQ oversight. Olympic Pipeline entered into an Independent Cleanup Pathway agreement with DEQ on April 12, 2005, to review project documents and determine steps to closure.

DEQ has determined that no further action is required to address environmental contamination resulting from a 1995 surface spill and a second fuel release discovered in 2000 at the site based on regulations and facts, including, but not limited to the following information:

- The ½ acre site is located at 9420 NW St. Helens Road Portland, Oregon 97231, on property leased from Shore Terminals LLC for operation of buried petroleum distribution pipelines. The Portland Delivery Facility is located upslope of a large bulk petroleum storage facility. The site is approximately 350 feet from the Willamette River.

- On November 12, 1995, a vacuum truck was transferring jet and diesel fuel to the Portland Delivery Facility pipeline when a pipe fitting broke resulting in a 200 to 250 gallons surface release of fuel. Remedial actions between November 12 and December 4, 1995 recovered an estimated 95% of the spilled fuel by vacuuming oil and water mixtures, excavating soils, and using sorbent materials. Site cleanup work included removal of 6,250 gallons of mixed petroleum and water, 114.59 tons of petroleum contaminated soil, and 3,300 pounds of spent sorbent materials. Following cleanup actions for the 1995 spill, soil samples were taken from the excavated areas. Confirmation soil data were compared against DEQ Level 2 Numeric Soil Cleanup Standards (OAR 340-122-335) in effect for 1995. Confirmation soil samples were found to be in compliance with applicable cleanup standards.

- During maintenance work at the Portland Delivery Facility in February 2000, petroleum-contaminated soil was found at the base of the southern 2000-barrel above ground storage tank. In order to determine the nature and extent of contamination, subsurface soil and groundwater within the ½ acre site were analyzed for petroleum, fuel constituents and metals. Subsurface soil samples detected low concentrations of total petroleum hydrocarbons

(TPH), volatile organic compounds (VOCs), poly-cyclic aromatic hydrocarbons (PAHs), and metals. All detected soil contaminants were found to be compliant with applicable DEQ Risk-Based Concentrations.

- Groundwater data from the Portland Delivery Facility indicated that a dissolved plume may extend off-site in the downgradient (northeasterly) direction. To evaluate the presence and extent of off-site groundwater contamination, DEQ reviewed groundwater data for the Shore Terminals bulk fuels facility downgradient of the Portland Delivery Facility for years 2005 through 2012. No significant contamination was observed attributable to the Portland Delivery Facility.

- A limited amount of contaminated soil and groundwater remains on and near the Portland Delivery Facility. DEQ approves leaving this contamination in-place because it does not present an unacceptable risk to human health and safety, to ecological receptors, or to the Willamette River based on the site conditions described in project documents.

- The Portland Delivery Facility was placed on DEQ's Confirmed Release List (CRL) in June 2002 as required by ORS 465.225. DEQ has determined the facility can now be removed from the CRL under ORS 465.230(1). DEQ will remove the Portland Delivery Facility from the CRL as part of this No Further Action Determination.

- This No Further Action Determination does not require public notice since the 1995 fuel spill was cleaned up under DEQ spill rules under OAR 340-142; the decision that no additional remedial measures are necessary for the 2000 release were made under Division 122; and removal from the CRL does not require public notice.

DEQ concludes that based on the information presented, the investigation and cleanup actions performed in response to fuel releases in 1995 and 2000 at the Portland Delivery Facility are protective of public health and the environment and require no further action under the Oregon Environmental Cleanup Law, ORS 465.200 et seq., unless new or previously undisclosed information becomes available. DEQ will update the Environmental Cleanup Site Information (ECSI) database to reflect this No Further Action Determination.

Any future work which includes management or disposal of contaminated soil or groundwater at the site must be performed in accordance with DEQ regulations and policies. DEQ recommends keeping site investigation and cleanup documents with the permanent facility records.

DEQ has determined that the fuel releases in 1995 and 2000 do not represent a significant source of contamination to the Willamette River. However, the Portland Delivery Facility is within the larger Shore Terminals, LLC facility, which is part of an ongoing Portland Harbor Source Control Evaluation overseen by DEQ. If the Portland Delivery Facility is later found to be a contributor in the Shore Terminals' Source Control Evaluation or any other site investigation, DEQ, EPA, or another government agency may request additional investigation work or source control measures at the Portland Delivery Facility. However, DEQ is not requesting any work by BP Pipelines & Logistics at this time.

Please call me with questions at 503-229-6015.

Sincerely,

Kenneth Thiessen, Hydrogeologist
Northwest Cleanup Section

Attachment:
DEQ, 2013. *No Further Action Recommendation for 1995 and 2000 Fuel Spills*. Oregon Department of Environmental Quality Memorandum to ECSI file #3342

Cc:

Kristine Koch, EPA Region 10
Richard Muza, EPA Region 10
Keith Johnson, Manager DEQ NWR
Tom Gainer, DEQ NWR
Matt McClincy, DEQ NWR
Gerald Gross, BP Olympic Pipe Line Company, 9420 NW St. Helens Road, Portland, OR 97231
Joe Aldridge, Shore Terminals LLC, 2330 North Loop 1604 West, San Antonio, TX 78248
Bryan Taylor, Project Manager, Antea Group, 4006 148th Avenue NE, Redmond, WA 98052

ECSI #3342

State of Oregon
Department of Environmental Quality Memorandum

Date: March 12, 2013

To: BP Olympic Pipe Line Company Portland Delivery Facility
ECSI #3342

From: Kenneth Thiessen, Northwest Cleanup Section

Subject: No Further Action Recommendation for 1995 and 2000 fuel spills

The Oregon Department of Environmental Quality (DEQ) has completed its review of site investigation reports, dated 1995 to 2004, for the Olympic Pipeline Portland Delivery Facility site. Project documents were submitted to DEQ in August 2012 by Bryan Taylor, Antea Group, to support this No Further Action (NFA) recommendation. The investigation and remediation work described in the reports was performed independently, without DEQ's oversight. Olympic Pipeline entered into an Independent Cleanup Pathway (ICP) agreement with DEQ on April 12, 2005, requesting agency review of project documents and site closure.

This memo also provides a preliminary Source Control Evaluation of contaminant pathways between the site and the Willamette River.

DEQ recommends that no further action be required to address environmental contamination resulting from a 1995 surface spill and a second fuel release discovered in 2000 at the Olympic Pipeline Portland Delivery Facility. This memo presents site information and data supporting this NFA recommendation.

Facility Description, Fuel Releases, Investigations and Cleanup Actions

The ½ acre site is located at 9420 NW St. Helens Road (Tax Lot 25, T1N, R1W, Sec 11, W. M.) near Portland, Oregon, is on property leased from Shore Terminals, LLC for operation of buried petroleum distribution pipelines (Figure 1). In the site investigation reports, the facility is variably referred to as the "Portland Delivery Facility" and the "Linnton Delivery Facility". "Portland Delivery Facility" will be used in this memo. The Portland Delivery Facility is operated by BP Pipelines and Logistics. The Portland Delivery Facility has been operating since July 1968, and is located entirely within the Shore Terminals fuel terminal (formerly: ExxonMobil, Mobil, Time Oil, ECSI# 137, 1989 & 5130). The Portland Delivery Facility site is located upslope of railroad tracks and many large petroleum above-ground bulk fuel tanks (Figure 2). The Portland Delivery Facility site is approximately 350 feet from the Willamette River.

DEQ visited the Portland Delivery Facility in November 2012 and noted substantial environmental improvements as compared to the site descriptions presented in the 1995 to 2004 documents reviewed for this NFA recommendation. The environmental improvements, installed in 2007, include a comprehensive stormwater and spill response management and treatment system. Stormwater from the site is treated and discharged to a bioswale southeast of the site. A weir at the downgradient end of the bioswale allows excess stormwater water to flow overland, possibly to river outfall WP-209.

November 12, 1995 fuel spill

On November 12, 1995, a vacuum truck transferring a jet/diesel fuel mixture under pressure to the Portland Delivery Facility pipeline spilled up to 250 gallons of fuel when a pipe fitting broke.

Specifics of the releases are described in the Dec. 18, 1995 *Spill Response and Cleanup Report*, by Pacific Northern Environmental. The surface spill flowed onto paved and unpaved areas. A portion of the fuel flowed to an off-site drainage ditch parallel to railroad tracks via three pathways: overland flow; catch basin capture and flow to an outfall at the drainage ditch; and drainage tile capture and flow to an outfall at the drainage ditch. Figure 3 illustrates the area affected by the fuel spill and pathways for fuel movement to the railroad drainage ditch.

A ditch relief culvert drains the railroad drainage ditch about 150 feet southeast of the Portland Delivery Facility site and conveys water to Oregon Department of Transportation (ODOT) outfall WP-209 on the Willamette River. The railroad drainage ditch also receives stormwater flow from Oregon State Highway 30 via another ODOT storm drainage capture and conveyance system.

Immediate and secondary remedial actions between November 12 and December 4, 1995, resulted in an estimated 95% recovery of the spilled fuel through removal of vacuumed oil/water mixtures from excavated sumps in the drainage ditch, excavated soils, and sorbent materials. Site cleanup work was performed under DEQ spill rules, Division 142, and included removal of 6,250 gallons of mixed petroleum and water, 114.59 tons of petroleum contaminated soil, and 3,300 pounds of spent sorbent materials.

Following cleanup actions, seven soil samples were collected from areas most affected by the spilled fuel to evaluate the effectiveness of cleanup efforts (Figure 4). These soil samples contained maximum residual contaminant concentrations of 15 mg/kg for TPH as gasoline, and 380 mg/kg for TPH as diesel. DEQ's Numeric Cleanup Standards (OAR 340 122-335) for this Level 2 site are 80 mg/kg for TPH as gasoline, and 500 mg/kg for TPH as diesel. The reported results of the 1995 cleanup actions indicate that no additional cleanup is necessary. No groundwater data was collected following the 1995 spill.

Fuel release discovered February 2000

During maintenance work at the Portland Delivery Facility site in February 2000, petroleum-contaminated soil was found at the base of the southern 2000-barrel above ground storage tank (AST) located on-site (Figure 5). The stained surface soil was observed below a tank-bottom flange, valve and piping on the east side of the AST within the gravel-floored secondary containment area. Surface soil samples and subsurface soil and groundwater samples were collected on-site in 2000 and 2001 to characterize the release. A small volume of petroleum-contaminated soil (less than 2 cubic yards) was excavated near the base of the southern AST to inspect buried piping for leaks and was transported off-site for disposal. At borings within 15 feet of the AST, (HA-3, HA-5 & HA-6), soil and groundwater contamination was found in the top four feet of soil exceeding relevant DEQ risk-based concentrations (RBCs) for gasoline and diesel (Figure 6). This petroleum-contaminated soil remains in-place.

GeoEngineers conducted a soil investigation in September 2000 for Olympic Pipeline Company focused on the petroleum stains adjacent to the AST. GeoEngineers subsequently completed a Phase II soil and groundwater investigation of the entire Portland Delivery Facility. Sampling results indentified gasoline, diesel and motor oil in groundwater. Lab notes indicated that the three fuel ranges represent "carry-over" from weathering and may include kerosene (jet fuel).

Groundwater Contamination

Groundwater below the Portland Delivery Facility site varies seasonally between one and eleven feet below ground surface. No measurable free-phase fuel product has been observed on the water table at the site. Dissolved contaminants were observed in groundwater at the northern down-gradient property

margin (Figure 7). Maximum groundwater concentrations in boring B-4 in February 2000 included TPH as gasoline at 966 ug/l, TPH as diesel at 14,400 ug/l, and TPH as oil at 22,800 ug/l. Dissolved benzene was detected in MW-3 at 96 ug/l in August 2002.

To evaluate the possible presence and extent of offsite groundwater contamination attributable to the Portland Delivery Facility, DEQ reviewed groundwater data for Shore Terminals' monitoring wells KMW 02, KMW- 03, KMW-05, KMW-06 and MW-40, within 200 feet of the Portland Delivery Facility, during the period February 2005 to February 2012. These wells are located downgradient (3), cross-gradient (1), and up-gradient (1) of the Portland Delivery Facility. No dissolved contaminants from these wells that exceeded of soil ingestion, dermal contact and inhalation RBCs.

Monitoring well MW-40, located 120 feet north of the Portland Delivery Facility in the down-gradient direction, is used to evaluate off-site groundwater impacts from the Portland Delivery Facility. Groundwater data from MW-40 indicates that dissolved benzene levels have decreased from 148 ug/L (March 2006) to 1.87 ug/L (November 2009) to ND <0.50 ug/L (February 2012). None of the contaminant concentrations in MW-40 exceed DEQ's RBCs for occupational exposure including volatilization to outdoor air, vapor intrusion into buildings, or groundwater volatilization in an excavation.

Findings of the Beneficial Use Survey

No beneficial use survey was performed for this industrial site. Groundwater below the site is not currently used, nor is it expected to be used in the future. The only identified "use" of groundwater is recharge of the Willamette River. Off-site data indicates that Portland Delivery Facility-related contamination in groundwater does not extent a significant distance off-site.

Findings of the Land Use Determination

No land use determination was performed for this industrial site. The site is currently zoned for industrial use, and is expected to remain industrial.

Human Health Risk Assessment

Fuel release discovered in year 2000
Residual soil contaminant data were compared with human health risk-based concentrations for fuel-related contaminants including volatile and semi-volatile organic compounds, EDB, EDC, MTBE, and lead. The pathways evaluated included surface soil ingestion, dermal contact, inhalation, volatilization to outdoor air, vapor intrusion into buildings. The *Nov. 2003 Semi-Annual Groundwater Monitorin*g report evaluated risk using human health exposure pathways compared 2004 DEQ RBCs.

With one exception, (HA-6, 1-2 ft, 9/2000) none of the contaminants detected in residual soil exceeded current DEQ RBCs. Delta Environmental Consultants (2004) reported benzo (a) pyrene in near-surface soil at a concentration of 0.28 mg/kg which slightly exceeds the SLV of 0.27 mg/kg for occupational soil ingestion and dermal contact and inhalation. DEQ does not believe that this slight exceedance at a single data point represents unacceptable risk at the site.

Given the present and future industrial use of this site, and that no contaminants evaluated appreciably exceed DEQ RBCs. DEQ has determined that site soils impacted from the 1995 fuel release and the fuel release discovered in 2000 do not pose an unacceptable risk as defined in ORS 465.315.

Ecological Risk Evaluation

Fuel release discovered in year 2000
A Level 1 Ecological Risk Assessment checklist was performed with no significant habitat, receptors, or findings indentified (Delta, 2004).

Rationale for Recommending NFA

November 12, 1995 fuel spill
Following immediate and secondary cleanup actions, soil samples were taken from the bottom and lateral margins of excavated areas. Confirmation soil data were compared to DEQ Level 2 Numeric Soil Cleanup Standards (OAR 340-122-335) and were found to be in compliance with applicable cleanup standards of 80 mg/kg for gasoline and 500 mg/kg for diesel.

Fuel release discovered in year 2000
In order to determine the nature and extent of contamination, subsurface soil and groundwater within the ½ acre site were analyzed for petroleum, fuel constituents and metals. Subsurface soil samples within 15 feet of the southern AST exceed occupational RBCs for TPH as gasoline and diesel. This contaminated area surrounding the ASTs is now paved with concrete as part of the 2007 secondary containment system surrounding the ASTs. Other site soil borings contained low concentrations of TPH, VOCs, PAHs, and metals below RBCs. DEQ approves leaving this contamination in-place because it does not present an unacceptable risk to human health and safety, to ecological receptors, or to the Willamette River.

Groundwater from four on-site monitoring wells was sampled seven times from 2001 through 2003. Contaminant concentrations for TPH, VOCs, PAHs, and metals in groundwater from each well were stable and below applicable RBCs for the following human health exposure scenarios: volatilization to outdoor air, vapor intrusion into buildings, and worker exposure to groundwater in excavations. Offsite monitoring wells did not produce a pattern of groundwater contaminants that indicate the Portland Delivery Facility site is a source of significant offsite groundwater contamination.

Comparison of Olympic Portland Delivery Facility Groundwater and soil data with ROD and JSCS Screening Level Values

Though this proposed NFA decision regarding the 1995 fuel spill and the release discovered in 2000 is based on RBCs published by DEQ, this property is adjacent to the Portland Harbor Superfund site and is within the Shore Terminals cleanup site. The Shore Terminals site has cleanup goals established by DEQ in a 1997 Record of Decision (ROD). Some groundwater contaminants at the Portland Delivery Facility exceed cleanup goals established by the ROD and the 2005 Portland Harbor Joint Source Control Strategy screening levels (JSCS Table 3-1).

Groundwater contaminants exceeding Shore Terminals ROD cleanup goals
As is illustrated in Table 1 below, several groundwater contaminants detected at the Portland Delivery Facility from 2001 to 2003 exceed ROD cleanup goals. The point where ROD compliance must be met is at the shoreline of the Willamette River. The Portland Delivery Facility is approximately 350 feet from the Willamette River. More importantly, groundwater data from MW-40, positioned 120 feet downgradient of the Portland Delivery Facility, does not show exceedances of ROD cleanup goals during the most recent (February 2012) sampling event. Portland Delivery Facility releases do not appear to have led to a significant exceedance of Shore Terminals' cleanup goals.

Groundwater contaminants exceeding JSCS Screening Level Values

As illustrated in Table 1 below, several contaminants in groundwater detected at the Portland Delivery Facility from 2001 to 2003 exceed JSCS Screening Level Values. Contaminants from an upland site may enter the river system via numerous pathways which are to be evaluated in a Source Control Evaluation. Following Table 1, DEQ has prepared a preliminary evaluation of source control pathways. The data provided in Table 1 are provided for comparison and do not constitute a requirement for remediation. Groundwater from monitoring well MW-40, positioned 120 feet downgradient of the Portland Delivery Facility, did not have exceedances of JSCS SLV in the most recent (February 2012) sampling event.

Table 1. Comparison of Portland Delivery Facility Groundwater Contaminants with Record of Decision (ROD) Cleanup goals for Shore Terminals site and Portland Harbor Joint Source Control Strategy Screening Level Values.

Constituent	ROD Cleanup Goals (Shore Terminals)	Portland Harbor JSCS SLVs	Olympic PDF mon. well data 2001-2003	Shore Terminals MW-40 Feb. 2012
TPHg	1 mg/l	1 mg/l	0.545 mg/l	< 0.25 mg/l
TPHd	1 mg/l	1 mg/l	1.240 mg/l	< 0.25 mg/l
TPHo	1 mg/l	1 mg/l	<0.50 mg/l	< 0.25 mg/l
Benzene	40 ug/l	1.2 ug/l	96 ug/l	< 0.50 ug/l
Toluene	------	9.8 ug/l	3.36 ug/l	< 0.50 ug/l
Ethylbenzene	------	7.3 ug/l	2.35 ug/l	< 0.50 ug/l
Xylenes	------	200 ug/l	8.05 ug/l	< 0.50 ug/l
MTBE	------	37 ug/l	6.17 ug/l	< 0.50 ug/l
Naphthalene	347 ug/l	0.2 ug/l	2.398 ug/l	< 0.20 ug/l
Diss. Arsenic	5 ug/l	0.045 ug/l	31 ug/l	< 1.0 ug/l
Diss. Copper	12 ug/l	2.7 ug/l	77.6 ug/l	< 1.0 ug/l
Diss. Lead	3.2 ug/l	0.54 ug/l	96 ug/l	< 1.0 ug/l

Note: Values in gray indicate exceedances of one or both benchmark values

Preliminary Source Control Pathway Evaluation

Stormwater to Surface Water Pathway

DEQ personnel visited the site in November 2012 and inspected the stormwater management system installed in 2007. The stormwater system consists of concrete basins and sealed secondary containment areas which are drained (via normally-closed, manually-opened valve) to a coalescing oil/water separator and then to a concrete holding reservoir. Periodically, after passing visual and olfactory inspection, the concrete reservoir is pumped to a bioswale for infiltration through site soils. NPDES compliance samples are collected from a weir at the downgradient end of the bioswale. DEQ observed discharge of the reservoir to the bioswale following a rainy period and on a rainy day and did not observe overland flow of water outside of the bioswale. A ditch relief culvert drains the railroad ditch to ODOT outfall WP-209 located approximately 50 feet down slope from the bioswale weir.

DEQ observations of the stormwater pathway from the Portland Delivery Facility to the Willamette River appear to be complete but the significance of this pathway will be determined in the Source Control Evaluation for the larger Shore Terminals site.

Groundwater to Surface Water Pathway
DEQ does not believe that groundwater contamination associated with the Portland Delivery Facility is a threat to the Willamette River, approximately 350 feet east of the site. To contain operational releases to groundwater from previous fuel releases from the bulk fuel terminal, a slurry wall is located along the Willamette River shoreline of the Shore Terminals facility. The slurry wall extends from near the ground surface downward to a fine-grained aquitard. Groundwater upslope of the slurry wall discharges to the Willamette River after passing through a dual-phase extraction treatment system at the northern end of the Shore Terminals facility. This dual-phase extraction treatment system is an in-situ treatment train designed to remove contaminants from groundwater to meet ROD requirements.

DEQ reviewed groundwater data from the Portland Delivery Facility as well as nearby Shore Terminals monitoring wells to determine if a contaminant plume extends offsite of the Portland Delivery Facility. Groundwater data were collected from Portland Delivery Facility on-site monitoring wells from 2001 to 2003 which indicated that contaminants may extend off site from the Portland Delivery Facility. Shore Terminals monitoring well MW-40, located 120 feet downgradient of the Portland Delivery Facility is positioned to evaluate possible offsite contaminant migration. February 2012 groundwater data from MW-40 did not produce contaminants of interest above analytical method detection limits. Preliminary DEQ observations indicate that Groundwater to Surface Water Pathway is incomplete.

Overland Transport/Sheet Flow Pathway
The surface of the ½ acre Portland Delivery Facility is approximately 50% hardscape as roofs or stormwater catchment system and 50% graded and covered by drain rock. The site is sloped approximately 5% to the east. DEQ did not observe evidence of overland water transport or sheet flow. Stormwater appears to infiltrate within the Portland Delivery Facility. Overland flow of stormwater to the Willamette River is therefore not considered a complete pathway.

Erodible Soils
Between the Portland Delivery Facility eastern fence and the railroad ditch, a short 25-30% slope is present, representing a potential erodible soil condition. DEQ observed this slope and found it to be adequately hardened with revetment material and stable. Erodible soils are therefore not considered to be present within the Portland Delivery Facility.

Conclusions

DEQ concludes that based on the information presented to date, the investigation and cleanup actions performed in response to fuel releases in 1995 and 2000 at the Portland Delivery site are protective of public health and the environment, and requires no further action under the Oregon Environmental Cleanup Law, ORS 465.200 et seq., unless new or previously undisclosed information becomes available. DEQ will update the Environmental Cleanup Site Information System (ECSI #3342) database to reflect this decision.

The Olympic Pipeline, Portland Delivery Facility was placed on DEQ's Confirmed Release List (CRL) in June 2002 as required by ORS 465.225. DEQ has determined the facility is now eligible for removal from the CRL under ORS 465.230(1). We will update the Environmental Cleanup Site Information System (ECSI #3342) database to reflect this decision.

DEQ recommends keeping a copy of all of the documentation associated with this remedial action with the permanent facility records.

Public Notification Requirements

The response to the 1995 fuel spill at the Portland Delivery Facility was cleaned up under DEQ spill rules OAR 340-142 which does not require public notice. DEQ's decision that no additional remedial measures are necessary for the 2000 release were made under Division 122 and does not require public notice. Removal from the CRL as well does not require public notice.

Attachments

Figure 1 - Vicinity Map
Figure 2 - Site Map, Olympic Pipeline Portland Delivery Facility within Shore Terminals
Figure 3 - 1995 Portland Delivery Facility fuel spill extent and site features
Figure 4 - 1995 Portland Delivery Facility fuel spill cleanup and sampling locations
Figure 5 - 2000 Portland Delivery Facility fuel release investigation and boring locations
Figure 6 - 2000 Portland Delivery Facility fuel release TPH and BTEX soil results, Sept. 2000
Figure 7 – Groundwater Analytical Results 11/4/2003

References

Ash Creek Associates. 2012. *First Semi-Annual 2012 Groundwater Monitoring Report*. Shore Terminal, LLC Portland Facility, Portland, Oregon.

AME Engineers and Earth Scientists. 2010. *2010 Annual Ground Water Monitoring Report and Remediation Report*. NuStar Portland Terminal, 9420 NW St. Helens Road, Portland, Oregon.

EPA/DEQ. 2005. *Portland Harbor Joint Source Control Strategy*.

Delta Environmental Consultants. 2004. *Environmental Status Summary Report and Request for No Further Action Determination.* Olympic Pipeline Portland Delivery Facility.

Delta Environmental Consultants. 2004. *Nov. 2003 Semi-Annual Groundwater Monitorin*g. Olympic Pipeline Company Portland Delivery Facility.

GeoEngineers. 2001. *Phase I Environmental Site Assessment.* Olympic Pipeline Company Portland Delivery Facility.

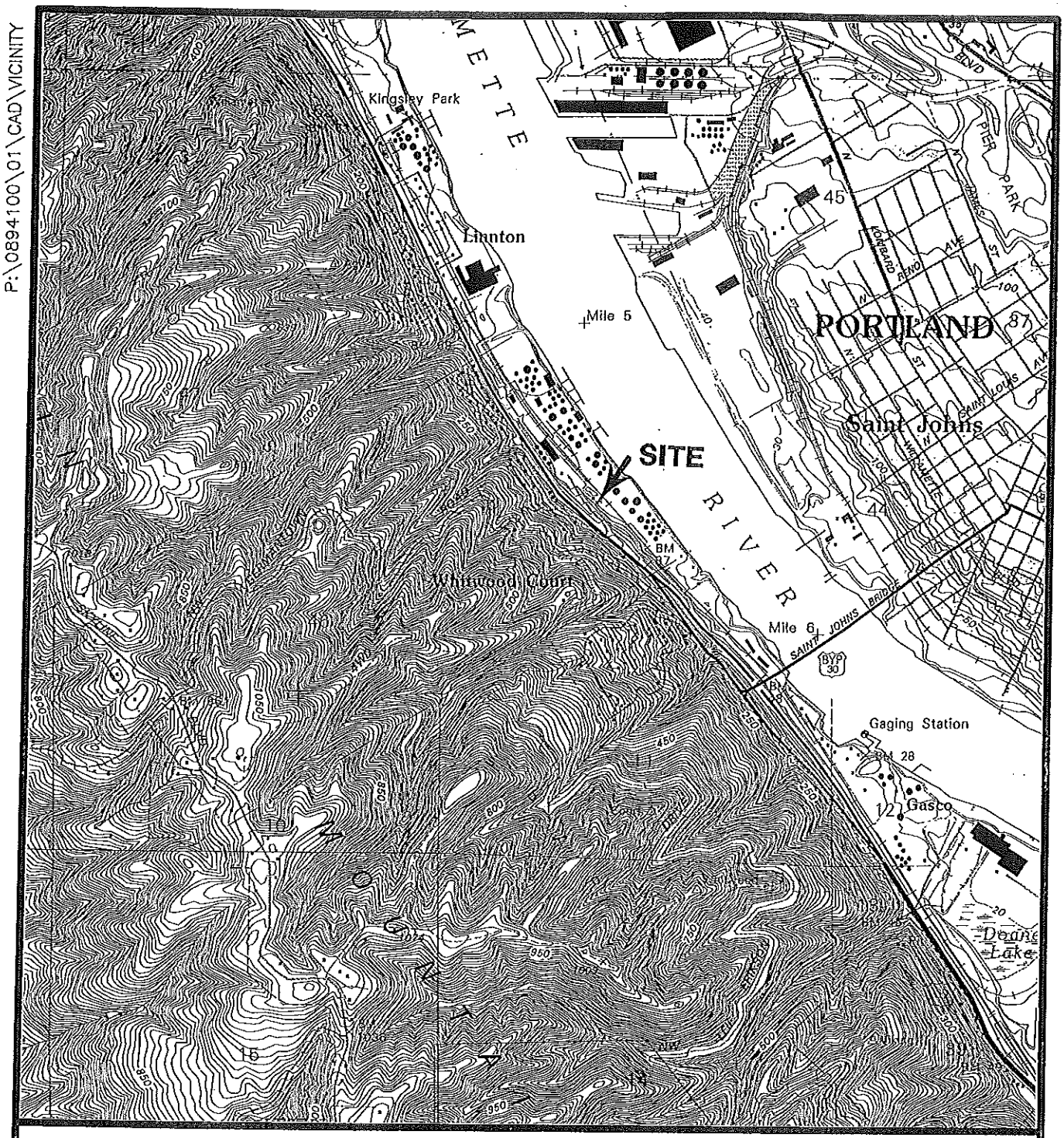
GeoEngineers. 2001. *Phase II Environmental Site Assessment.* Olympic Pipeline Company Portland Delivery Facility.

GeoEngineers. 2000. *Sept. 2000 Tank Farm Soil Sampling and Analysis*. Olympic Pipeline Company Portland Delivery Facility.

Pacific Northern Environmental 1995. *Above Ground Petroleum Spill Response and Independent Cleanup Report,* Olympic Pipeline.

Landslide Technology. 1995. *Environmental Sampling Program*. Portland Delivery Facility.

P:\0894100\01\CAD\VICINITY



0 2000 4000
SCALE IN FEET

Reference: USGS 7.5' topographic quadrangle map, "Linnton, OR," dated 1990.

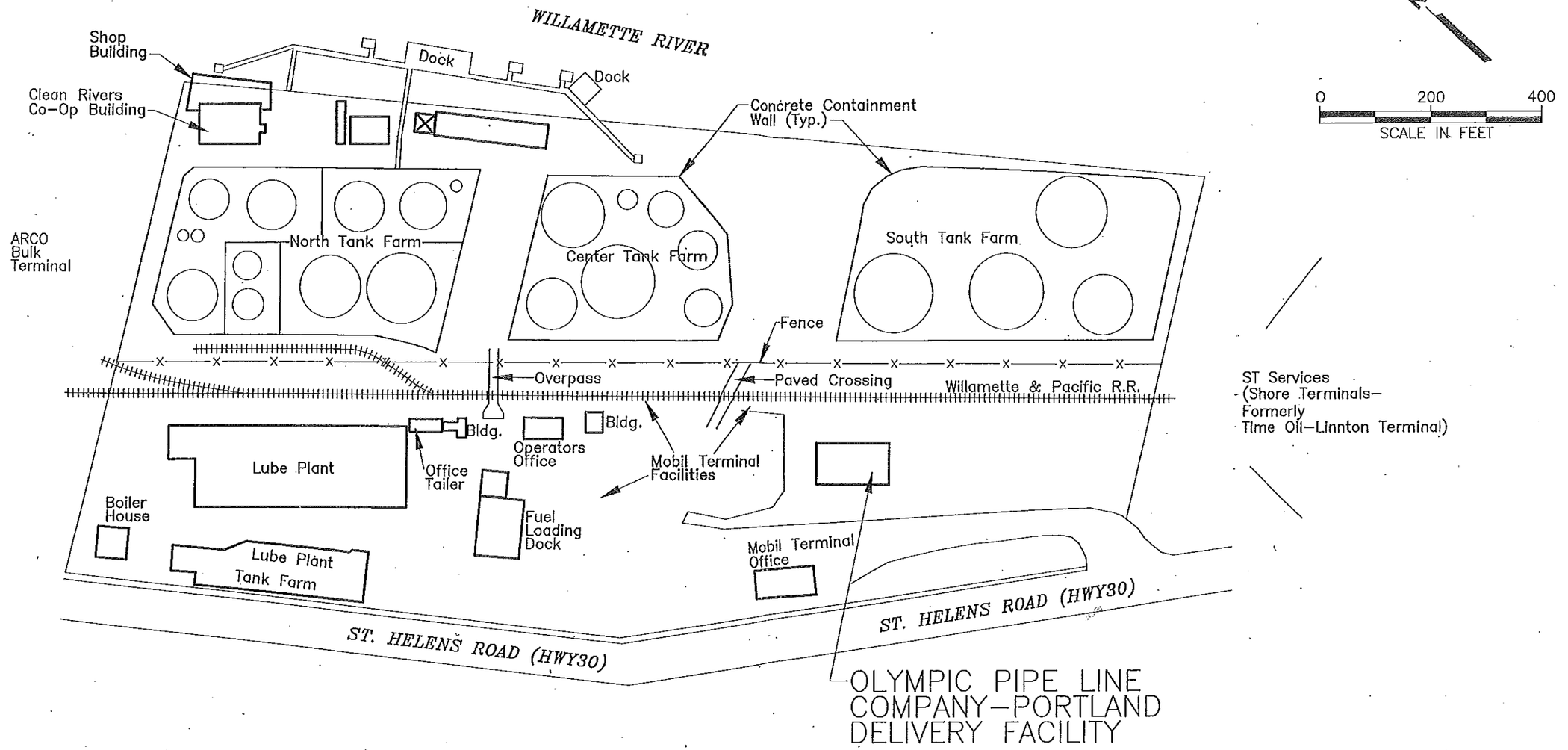
0894-100-01 MB2:MWJ 02/12/01

GeoEngineers

VICINITY MAP

FIGURE 1

P:\0894100\01\CAD\SITE



Notes: 1. The locations of all features shown are approximate.

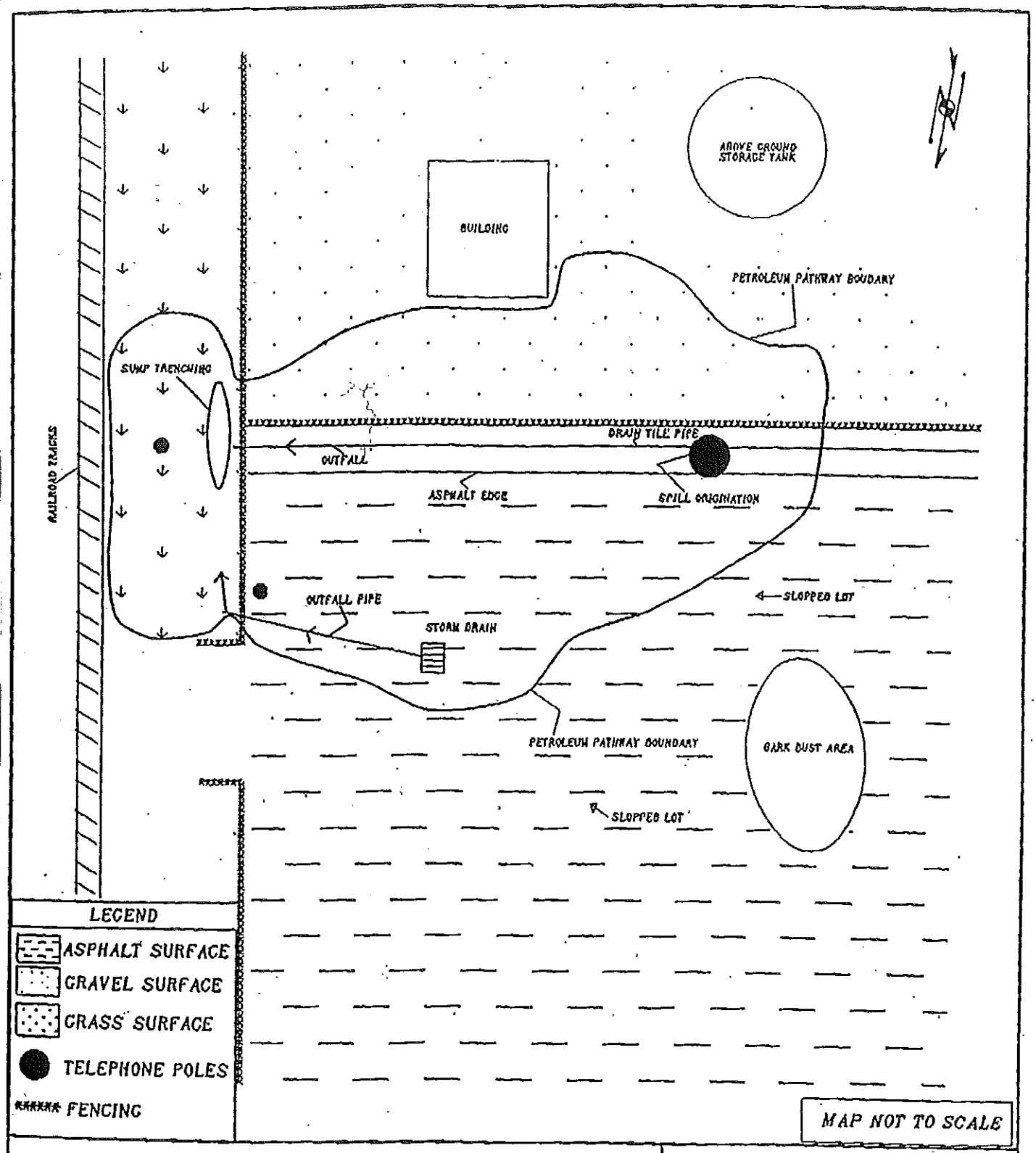
Reference: Base drawing entitled "Cross Section Site Plan Exxon/Mobil Portland Terminal #36--001 Portland Oregon," by Kleindfelder, Inc., dated September 2000.

GeoEngineers

Site Map, Olympic Pipeline Portland Delivery Facility
Within Shore Terminals Bulk Oil Terminal

FIGURE 2

0894-100-01 MB2:MWJ 05/18/01

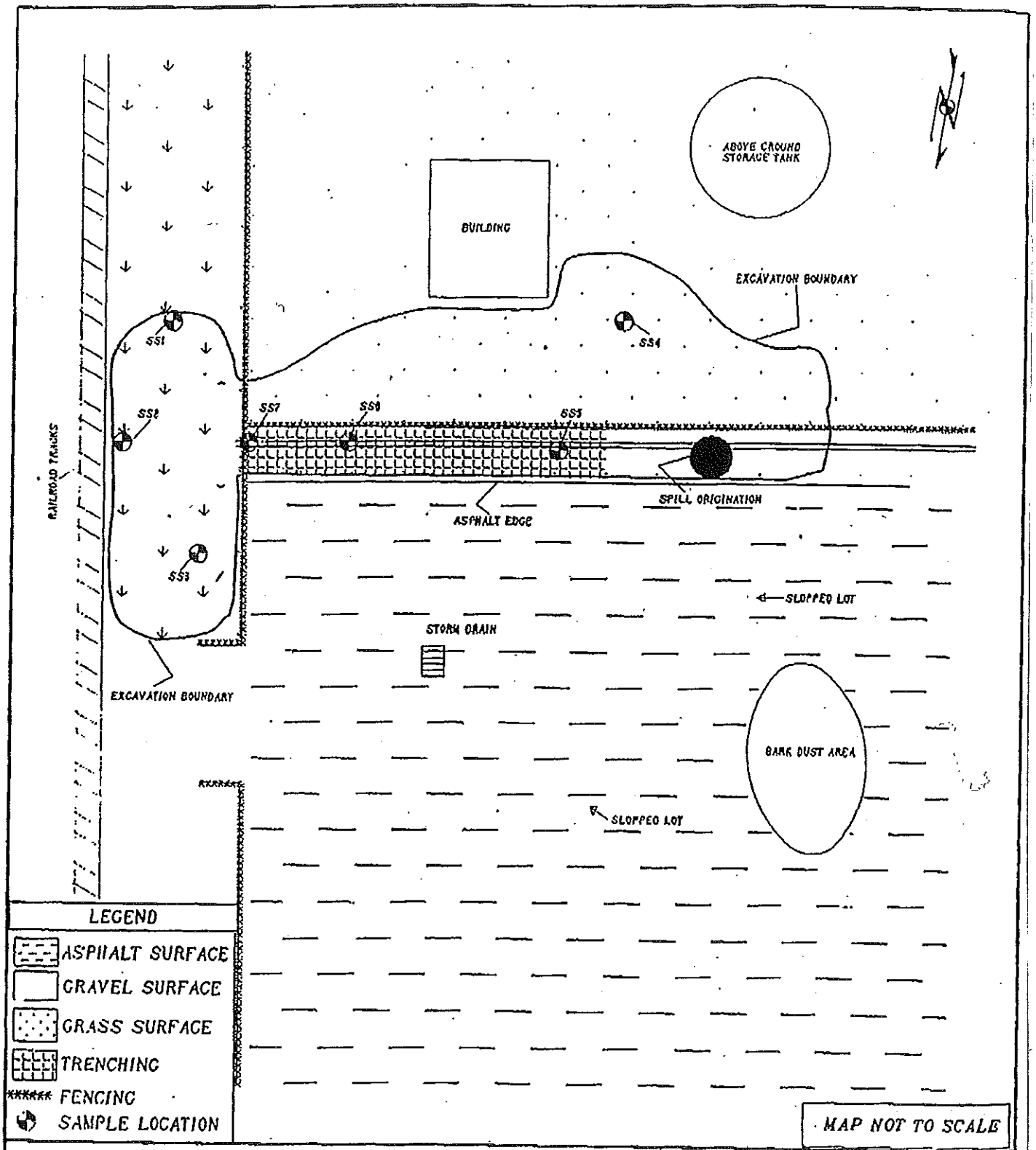


OLYMPIC PIPELINE
9420 N.W. ST. HELENS ROAD
PORTLAND, OREGON

FIGURE 3

1995 Portland Delivery Facility
fuel spill extent and site features

PACIFIC NORTHERN ENVIRONMENTAL



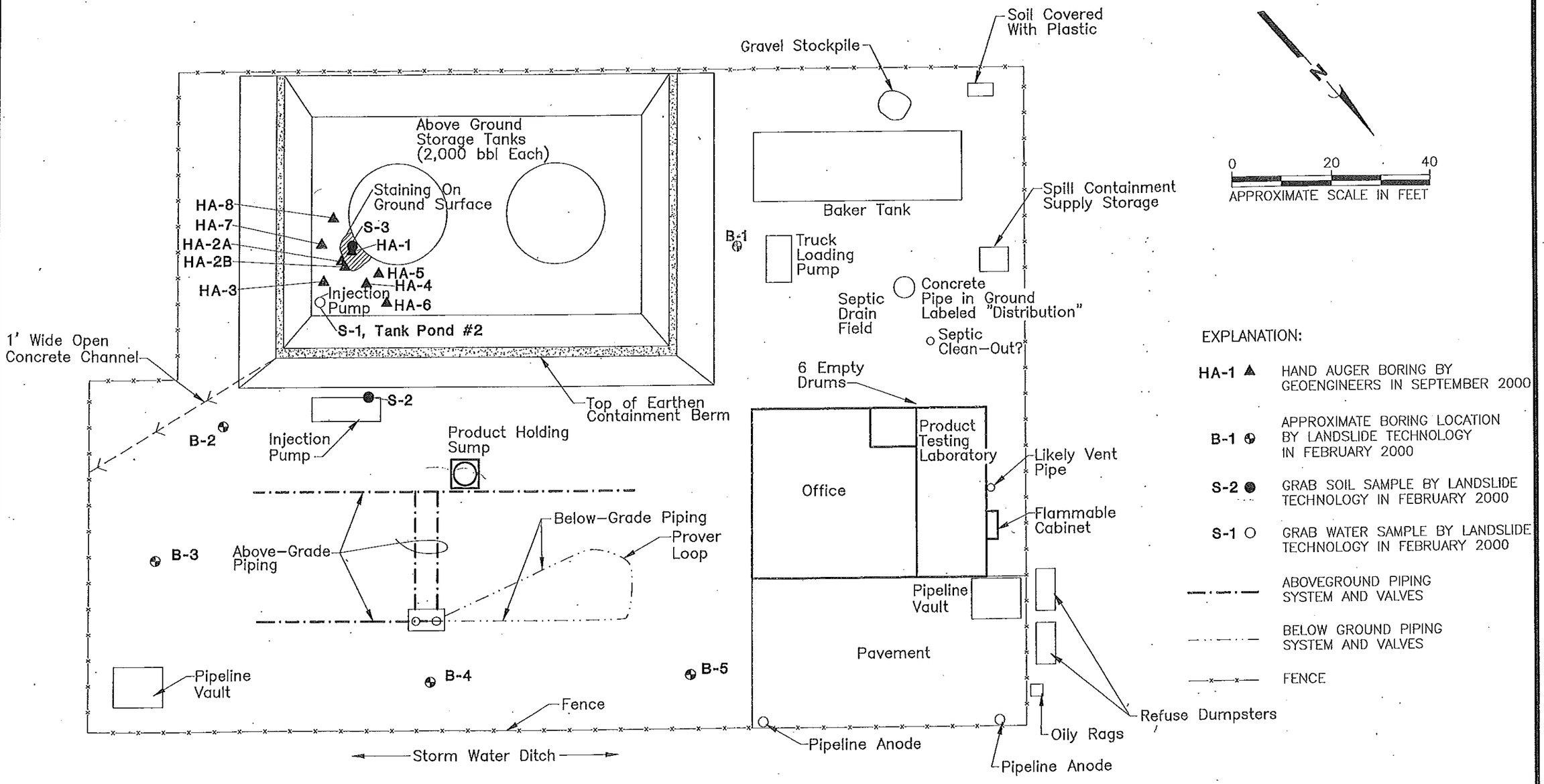
OLYMPIC PIPELINE
9420 N.W. ST. HELENS ROAD
PORTLAND, OREGON

FIGURE 4

1995 Portland Delivery Facility fuel spill cleanup and sampling locations

PACIFIC NORTHERN ENVIRONMENTAL

P:\0894100\00\CAD\FIGURE5



Notes: 1. The locations of all features shown are approximate.
2. The numerous above-and below-grade piping extensions are not shown on this figure.
3. Actual AST containment berm size is 60 feet by 100 feet in plan.

Reference: Base drawing entitled "Site Plan Sketch," of OPLC Portland Delivery Facility by Landslide Technology, dated March 2000.

GeoEngineers

2000 Portland Delivery Facility fuel release investigation and boring locations

FIGURE 5

0894-100-01 MB2:MWJ 02/12/01

P:\0894100\00\CAD\GW_BX1

HA-7	G	D	O	B	E	T	X
HA-7-(2-3)	14.6	<25.0	<50.0	<0.0500	<0.0500	<0.0500	<0.0500

Fence Line

HA-8	G	D	O	B	E	T	X
HA-8-(0-1)	2.57	<25.0	<50.0	<0.0500	<0.0500	<0.0500	<0.0500

HA-1	G	D	O	B	E	T	X
HA-1-(1-2)	<2.00	<25.0	<50.0	<0.0500	<0.0500	<0.0500	<0.0500

HA-5	G	D	O	B	E	T	X
HA-5-(0-1)	383	<25.0	<50.0	<0.200	<0.200	<0.200	0.857

Top of Containment Berm

HA-8
HA-7
HA-1
HA-2A
HA-2B
HA-4
HA-5
HA-3
HA-6

Utility Tank

Utility Tank

6"

10"

HA-4	G	D	O	B	E	T	X
HA-4-(2-3)	2.20	759	<50.0	<0.0500	<0.0500	<0.0500	<0.0500

HA-6	G	D	O	B	E	T	X
HA-6-(1-2)	241	1,500	116	<0.200	<0.200	<0.200	0.449
HA-6-(3-4)	285	290	<50.0	<0.200	0.377	<0.200	1.08

Top of Containment Berm

Top of Containment Berm

8" Drain

6"

10"

HA-2B	G	D	O	B	E	T	X
HA-2B-(4-5)	58.2	<25.0	<50.0	<0.0500	0.119	0.115	0.513

HA-2A	G	D	O	B	E	T	X
HA-2A-(0-1)	<2.00	<25.0	<50.0	<0.0500	<0.0500	<0.0500	<0.0500
HA-2A-(2-3)	70.6	349	<50.0	<0.0500	<0.0500	<0.0500	0.168

HA-3	G	D	O	B	E	T	X
HA-3-(1-2)	272	830	54.9	<0.200	0.756	<0.200	1.17
HA-3-(3-4)	43.5	<25.0	<50.0	<0.0500	<0.0752	<0.0500	0.170

N

0 10 20

SCALE IN FEET

EXPLANATION:

HA-1 ● HAND AUGER BORING BY GEOENGINEERS ON 09/27/00

B BENZENE (mg/kg)

E ETHYLBENZENE (mg/kg)

T TOLUENE (mg/kg)

X XYLENES (mg/kg)

-- NOT TESTED

ND NONE DETECTED

(mg/kg) MILLIGRAMS PER KILOGRAM

NOTES:

Note: 1. The locations of all features shown are approximate.

2. See Figure 2 for identification of site features.

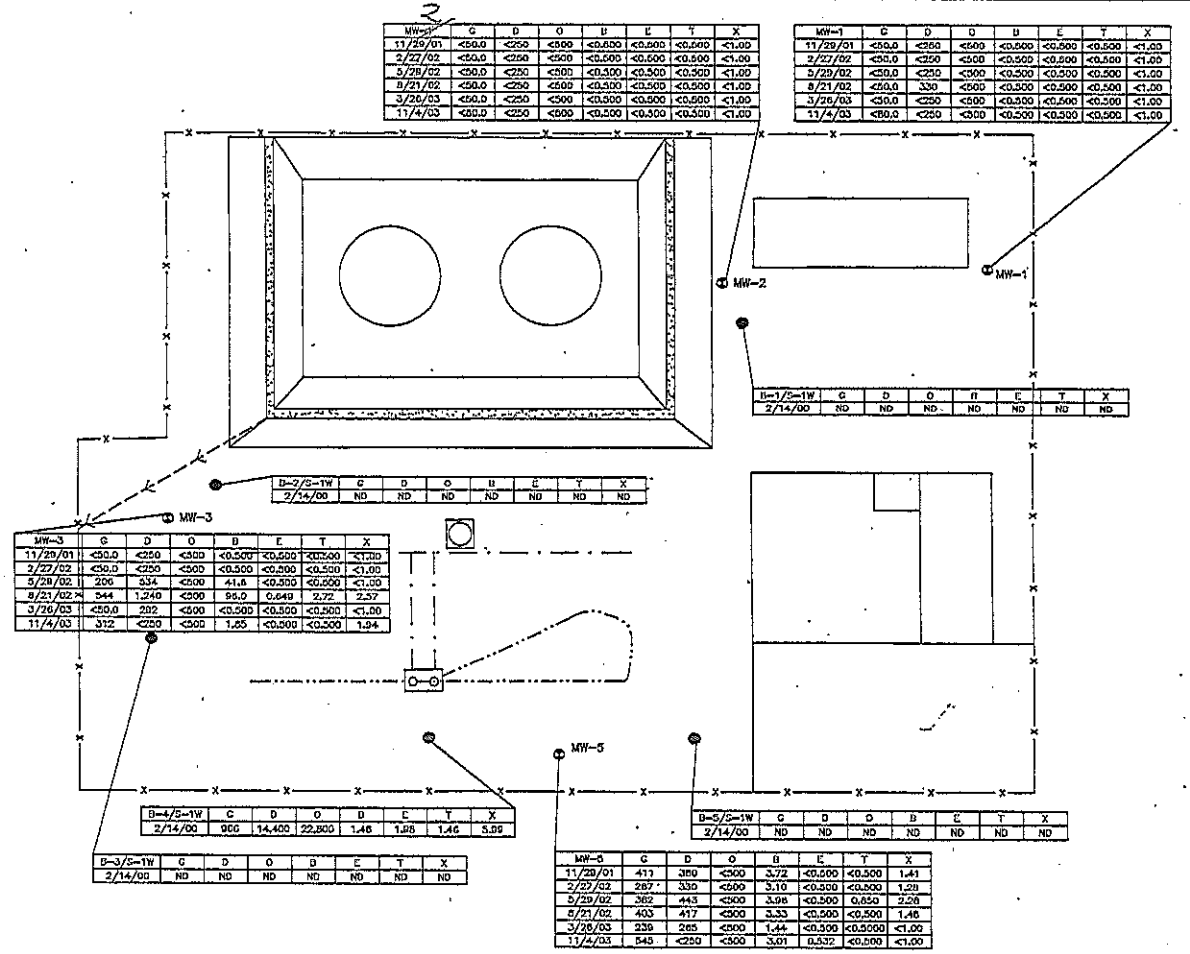
Reference: Drawing entitled "Portland Delivery Facilities Plot Plan, Olympic Pipe Line Company Renton, Wa, dated 12/10/64.

0894-100-00 WHC:MWJ 12/22/00

GeoEngineers

2000 Portland Delivery Facility fuel release
TPH and BTEX soil results, Sept. 2000

FIGURE 6



MW-2	G	D	O	B	E	T	X
11/29/01	<50.0	<250	<500	<0.500	<0.500	<0.500	<1.00
2/27/02	<50.0	<250	<500	<0.500	<0.500	<0.500	<1.00
5/29/02	<50.0	<250	<500	<0.500	<0.500	<0.500	<1.00
8/21/02	<50.0	<250	<500	<0.500	<0.500	<0.500	<1.00
3/26/03	<50.0	<250	<500	<0.500	<0.500	<0.500	<1.00
11/4/03	<50.0	<250	<500	<0.500	<0.500	<0.500	<1.00

MW-1	G	D	O	B	E	T	X
11/29/01	<50.0	<250	<500	<0.500	<0.500	<0.500	<1.00
2/27/02	<50.0	<250	<500	<0.500	<0.500	<0.500	<1.00
5/29/02	<50.0	<250	<500	<0.500	<0.500	<0.500	<1.00
8/21/02	<50.0	330	<500	<0.500	<0.500	<0.500	<1.00
3/26/03	<50.0	<250	<500	<0.500	<0.500	<0.500	<1.00
11/4/03	<50.0	<250	<500	<0.500	<0.500	<0.500	<1.00

B-1/S-1W	G	D	O	B	E	T	X
2/14/00	ND	ND	ND	ND	ND	ND	ND

B-2/S-1W	G	D	O	B	E	T	X
2/14/00	ND	ND	ND	ND	ND	ND	ND

MW-3	G	D	O	B	E	T	X
11/29/01	<50.0	<250	<500	<0.500	<0.500	<0.500	<1.00
2/27/02	<50.0	<250	<500	<0.500	<0.500	<0.500	<1.00
5/29/02	206	534	<500	41.6	<0.500	<0.500	<1.00
8/21/02	544	1,240	<500	95.0	0.649	2.72	2.57
3/26/03	<50.0	282	<500	<0.500	<0.500	<0.500	<1.00
11/4/03	312	<250	<500	1.85	<0.500	<0.500	1.94

B-4/S-1W	G	D	O	B	E	T	X
2/14/00	900	14,400	22,800	1.46	1.98	1.46	5.09

B-3/S-1W	G	D	O	B	E	T	X
2/14/00	ND	ND	ND	ND	ND	ND	ND

MW-5	G	D	O	B	E	T	X
11/29/01	417	389	<500	3.72	<0.500	<0.500	1.41
2/27/02	287	330	<500	3.10	<0.500	<0.500	1.28
5/29/02	362	443	<500	3.98	<0.500	0.650	2.26
8/21/02	403	417	<500	3.33	<0.500	<0.500	1.46
3/26/03	239	265	<500	1.44	<0.500	<0.5000	<1.00
11/4/03	545	<250	<500	3.01	0.532	<0.500	<1.00

B-5/S-1W	G	D	O	B	E	T	X
2/14/00	ND	ND	ND	ND	ND	ND	ND

LEGEND:

MW-1	MONITORING WELL BY GEOENGINEERS IN FEBRUARY 2001
B-1	BORING BY LANDSLIDE TECHNOLOGY IN FEBRUARY 2000
— · —	ABOVE-GRADE PIPING SYSTEM AND VALVES
— · · —	BELOW-GRADE PIPING SYSTEM AND VALVES
—x—x—	FENCE
G	GASOLINE (ug/l)
D	DIESEL (ug/l)
O	OIL (ug/l)
B	BENZENE (ug/l)
E	ETHYLBENZENE (ug/l)
T	TOLUENE (ug/l)
X	XYLENES (ug/l)
(ug/l)	MICROGRAMS PER LITER
ND	NOT DETECTED
—	NOT ANALYZED

North

0 30

SCALE IN FEET

NOTES:
1. This figure is a reproduction of a hard copy figure from GeoEngineers, Inc. with updates from Delta Environmental Consultants Inc.
2. The locations of all features shown are approximate.
3. The numerous above- and below- grade piping extensions are not shown on this figure.
4. Actual AST containment berm size is 60 feet by 100 feet in plan.
5. This figure is for informational purposes only. It is intended to assist in the identification of features discussed in a related document. Data were compiled from sources as listed in this figure. The data sources do not guarantee these data are accurate or complete. There may have been updates to the data since the publication of this figure. This figure is a copy of a master document. The master hard copy is stored by Delta Environmental Consultants, Inc. and will serve as the official document of record.

Reference: Base drawing entitled "Site Plan Sketch," of OPLC Portland Delivery Facility by Landslide Technology, dated March 2000.

FIGURE 7

GROUNDWATER ANALYTICAL RESULTS– 11/04/03
OLYMPIC PIPE LINE COMPANY
PORTLAND DELIVERY FACILITY
PORTLAND, OREGON

PROJECT NO.	PREPARED BY	DRAWN BY
L001-807-6	YH	JH
DATE	REVIEWED BY	FILE NAME
12/10/03		PORTLAND

Delta Environmental Consultants, Inc.